WHAT IS CLAIMED

1. A system for determining the orientation of fibers in a fibrous material web, the system comprising:

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at least one source of electromagnetic radiation disposed on one side of the fibrous material web;

at least one sensor for sensing the electromagnetic radiation emitted by the at least one source disposed on another side of the fibrous material web; and

at least one optical device disposed between the at least one source and the at least one sensor,

wherein the electromagnetic radiation travels through the at least one optical device and the fibrous material web such that the at least one optical device influences a propagation of the electromagnetic radiation as a function of its polarization properties.

2. The system of claim 1, wherein the fibrous material web is a paper web.

3. The system of claim 1, wherein the at least one optical device provides for the transmission of linearly polarized radiation.

4. The system of claim 1, wherein the at least one optical device is a polarizing filter.

5. The system of claim 3, wherein the polarizing filter is rotatably mounted about an axis.

6. The system of claim 5, wherein the axis is approximately perpendicular to a running direction of the fibrous material web.

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7. The system of claim 1, wherein the at least one optical device comprises at least two optical devices, one optical device being disposed on one side of the fibrous material web and another optical device being disposed on another side of the fibrous material web.

8. The system of claim 1, wherein the at least one optical device comprises at least two optical devices, the at least two optical devices being disposed on one side of the fibrous material web.

9. The system of claim 8, wherein the at least two optical devices are disposed between the at least one sensor and the fibrous material web.

10. The system of claim 9, wherein each of the at least two optical devices have a different orientation relative to a running direction of the fibrous material web.

11. The system of claim 8, further comprising at least one optical device disposed between the at least one source and the fibrous material web.

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12. The system of claim 11, wherein the at least two optical devices are oriented symmetrically relative to the at least one optical device.

13. The system of claim 8, wherein each of the at least two optical devices is rotatably mounted about an axis.

14. The system of claim 13, wherein each of the at least two optical devices is rotatable in opposite directions from one another.

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15. The system of claim 1, wherein the at least one optical device comprises a single optical device disposed between the at least one sensor and the fibrous material web.

16. The system of claim 15, wherein the electromagnetic radiation emitted by the at least one source is polarized before it passes through the fibrous material web.

17. The system of claim 15, wherein the single optical device is rotatably mounted.

18. The system of claim 1, wherein the at least one optical device comprises a single optical device disposed between the at least one source and the fibrous material web.

19. The system of claim 18, wherein the electromagnetic radiation sensed by the at least one sensor passes through the fibrous material web without being polarized.

20. The system of claim 18, wherein the single optical device is rotatably mounted.

21. The system of claim 9, wherein the at least one sensor comprises at least two sensors, each of the sensors being associated with an optical device.

22. The system of claim 1, wherein the electromagnetic radiation comprises one of a discrete and a continuous wavelength spectrum.

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23. The system of claim 1, wherein the electromagnetic radiation comprises a discrete and a continuous wavelength spectrum.

24. The system of claim 1, wherein the electromagnetic radiation comprises one of visible light and infrared radiation.

25. The system of claim 1, wherein the electromagnetic radiation comprises visible light and infrared radiation.

26. The system of claim 1, wherein the at least one sensor comprises one of a spectrometer and a photodiode.

27. The system of claim 1, wherein the at least one sensor is coupled to an analysis unit.

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28. A method for determining the orientation of fibers in a fibrous material web, the method comprising:

exposing a first side of the fibrous material web to electromagnetic radiation from at least one source;

allowing the electromagnetic radiation to penetrate to a second side of the fibrous material web;

influencing a propagation of the electromagnetic radiation as a function of its polarization properties with at least one optical device disposed between the at least one source and at least one sensor; and

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sensing the electromagnetic radiation on the second side with the at least one sensor.

29. The method of claim 28, wherein the fibrous material web is a paper web.

30. The method of claim 28, wherein the at least optical device comprises a polarizing filter disposed between the at least one source and the at least one sensor.

31. The method of claim 28, wherein the influencing further comprises disposing a first optical device on the first side and a second optical device on the second side.

32. The method of claim 31, wherein the influencing further comprises rotating the first optical device about an axis.

33. The method of claim 32, wherein the second optical device comprises a plurality of optical devices.

34. The method of claim 33, wherein the plurality of optical devices are arranged adjacent one another, each of the plurality being oriented to influence the propagation differently.

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35. The method of claim 31, wherein the influencing further comprises rotating the second optical device about an axis.

36. The method of claim 31, wherein the influencing further comprises continuously moving the fibrous material web between the first optical device and the second optical device.

37. The method of claim 28, wherein the influencing further comprises continuously moving the fibrous material wed between the at least one source and the at least one sensor.

38. The method of claim 28, further comprising analyzing a signal generated by the at least one sensor using an analyzer which is coupled to the at least one sensor.

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39. The method of claim 28, further comprising analyzing the electromagnetic radiation after sensing.

40. The method of claim 39, wherein the analyzing further comprises analyzing the electromagnetic radiation separately by wavelength.

41. The method of claim 28, wherein the exposing comprises using a plurality of different sources.

42. The method of claim 41, wherein the different sources vary a wavelength of the electromagnetic radiation over time.

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43. The method of claim 28, wherein the exposing comprises varying a wavelength of the electromagnetic radiation over time.

44. The method of claim 28, further comprising analyzing a signal generated by the at least one sensor using an analyzer which is coupled to the at least one sensor to determine one of a difference signal, a summation signal and a ratio signal.

45. The method of claim 28, further comprising analyzing signals generated by a plurality of sensors using an analyzer which is coupled to the plurality and determining one of a difference signal, a summation signal and a ratio signal.

46. The method of claim 45, wherein the determining comprises determining a difference signal, a summation signal and a ratio signal.

47. The method of claim 28, further comprising moving the fibrous material web between the at least one source and the at least one sensor.

48. The method of claim 47, wherein the moving is at a constant speed.

49. The method of claim 48, wherein the fibrous material web is a paper web.

50. The method of claim 28, wherein the electromagnetic radiation comprises one of a visible light and a infrared radiation.

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51. The method of claim 50, wherein the influencing comprises first polarizing the electromagnetic radiation on the first side using a first polarizing filter and then polarizing the electromagnetic radiation on the second side using a second polarizing filter.

52. The method of claim 51, wherein one of the first polarizing filter and the second polarizing filter is rotatable.

53. The method of claim 51, wherein the polarizing on the first side comprises using a rotatable first polarizing filter.

54. The method of claim 51, wherein the polarizing on the second side comprises using a plurality of oriented second polarizing filters.

55. The method of claim 54, wherein each of the plurality of second polarizing filters are rotatable.

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